Symantec NetBackup Blueprints

Blueprint for Bare Metal Restore (BMR)

Symantec Backup and Recovery Technical Services

Notice

This NetBackup Blueprint presentation includes example diagrams that contain objects that represent applications and platforms from other companies such as Microsoft and VMware. These diagrams may or may not match or resemble actual implementations found in end user environments. Any likeness or similarity to actual end user environments is completely by coincidence.

The goal of the diagrams included in this blueprint presentation is not to recommend specific ways in which to implement applications and platforms from other companies such as Microsoft and VMware; the purpose of these diagrams is to illustrate NetBackup best practices only.

For guidelines and best practices on installing and configuring applications and platforms from other companies, please refer to best practice documentation and other resources provided by those companies.

Symantec NetBackup Blueprints
How to use ?

These **Blueprints** are designed to show customer challenges and how NetBackup solves those.

- Each Blueprint consists of:
  - **Pain Points**: Explain the current challenges a customer faces.
  - **Whiteboards & Example Diagrams**: Describe the implementation of NetBackup solution.
  - **Best Practices**: Present NetBackup best practices to avoid common pitfalls
- Use these **Blueprints** to present the NetBackup best practice implementation example

Pain Points

Today's challenges

When a server must be recovered from bare metal, the recovery process presents several challenges to the IT staff:

- System recovery takes too long.
- Nonintegrated methods for system recovery are complex and require highly skilled staff.
- Dissimilar system restore and Dissimilar disk restore.
- Recovery procedures and tools vary from platform to platform.
- System configurations and changes are often not tracked.
- Quickly performs a diskless boot from the network.
- Physical to Virtual conversion.

NetBackup Advantages

What is NetBackup Bare Metal Restore ?

- NetBackup Bare Metal Restore (BMR) is the server recovery option of NetBackup. BMR automates and streamlines the server recovery process, making it unnecessary to reinstall operating systems or configure hardware manually. You can restore servers in a fraction of the time without extensive training or tedious administration.
- BMR restores the operating system, the system configuration, and all the system files and the data files with the following steps:
  - Run a single command or a single mouse click from the NetBackup master server.
  - Reboot the client to get client recover automatically.

NetBackup Blueprints: Advantages
Bare Metal Restore features

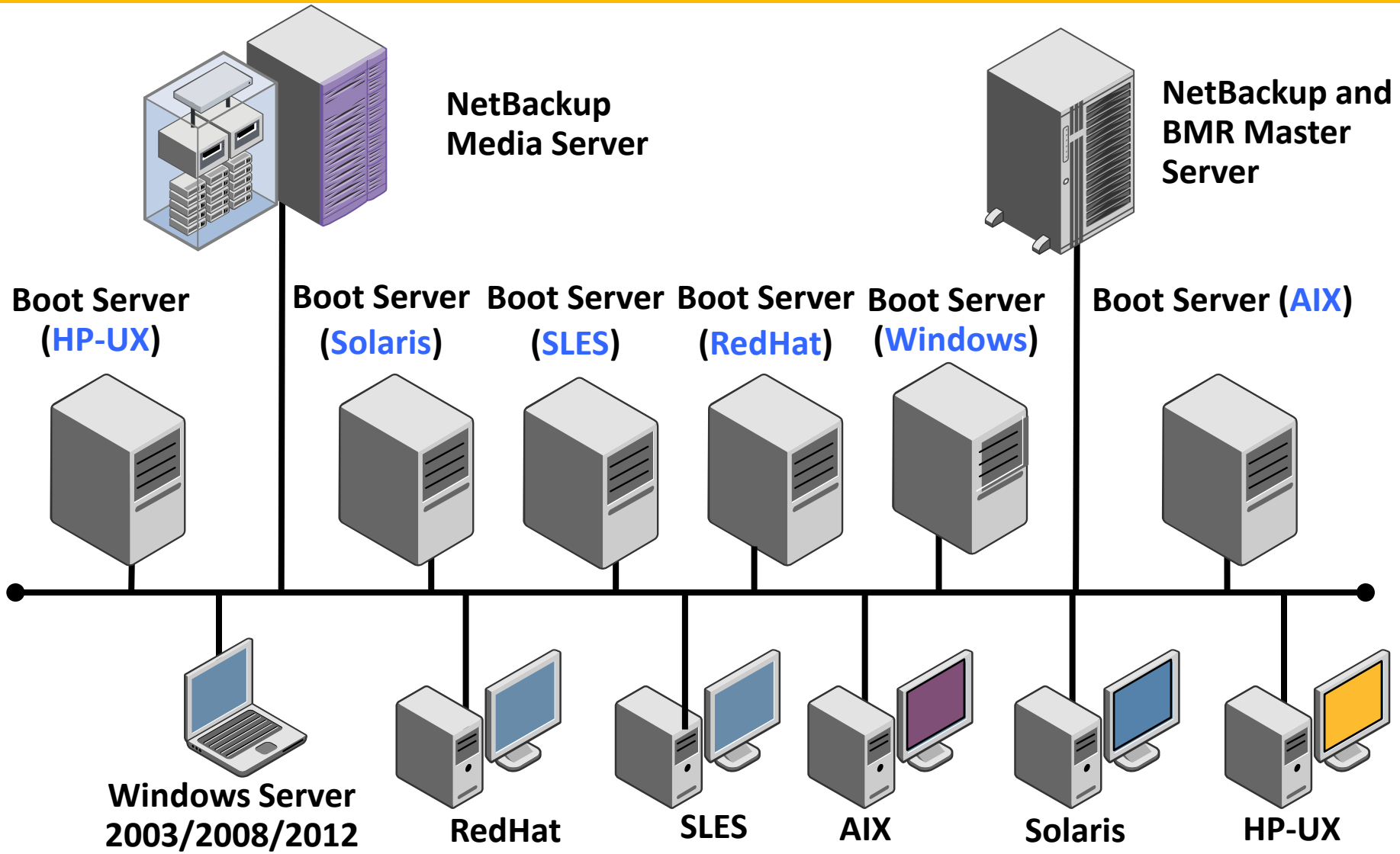
- Support of Windows, Solaris, AIX, HP-UX, and Linux platforms
  - One option addresses the demands of multiple platforms, eliminating the need for customized restore procedures on each platform.
- Dissimilar system restore (DSR)
  - The capability to restore a machine into a complete different hardware (Windows only).
- Dissimilar disk restore (DDR)
  - The capability to restore to a machine that has a different disk configuration than the original machine.
- Point-in-Time Restore
  - Restore systems back to the point of the last successful backup or to previous backup images.
- External procedures
  - Insert custom scripts within the restore process to help automate operations such as database recovery or application recovery
- Rapid-Fire recovery
  - Execute multiple server restores in parallel to accomplish mass recovery.
- Support network boot and media boot
- Physical to Virtual conversion (P2V)

Whiteboards and Diagrams

White Boards: BMR
Terminology

Term	Description
Shared Resource Tree (SRT)	A source of system resources, including the means to rebuild the client system and restore all system files.
Media boot	This is the process of booting a client using a CD or a DVD.
Network Boot	This is the process of downloading boot code to enable a client to boot out of RAM. The details are different for Windows and UNIX.
Protection domain	A logical grouping of BMR servers and clients that includes the following: one BMR master server, one or more BMR boot servers, and one or more protected clients.
Prepare to restore	Operation that runs on the master server and prepares all the resources necessary to restore the client.
Prepare to discover	Operation that runs on the master server and prepares all the resources necessary to do a discovery boot of a client.
Client configuration	A collection of information about the system. This information includes the following: the number of disk drives, volume and file system information, number and type of network adapters, network properties, drivers, and other system software components.

White Boards: BMR
Example Protection Domain

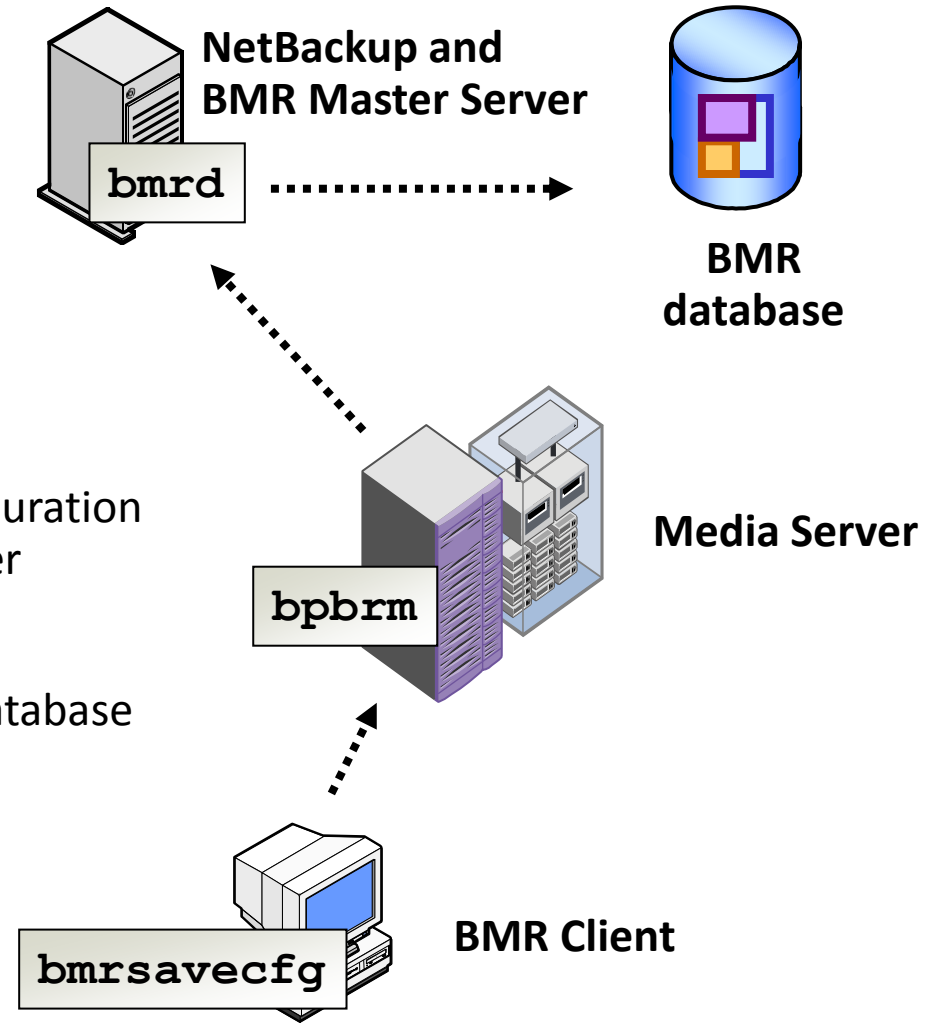


Shared Resource Trees

- A shared resource tree (SRT) is BMR system recovery critical software which is a collection of the following:
  - Operating system files
  - NetBackup client software
  - Programs that format drives, create partitions, rebuild file systems, and restore the original files using the NetBackup client software
- For UNIX and Linux systems, each client type and operating system version requires its own SRT; for Windows systems, a single SRT can restore all Windows versions of the same architecture.
- For UNIX and Linux systems, the boot server must run the same version or a later version of the operating system that is installed in the SRT; for Windows systems, any version of Windows can host the SRT.

Whiteboards: BMR
BMR Client Backup Workflow

1. Scheduled backup begins.
2. `bmrsavecfg` collects client configuration information
3. Send client information to the media server
4. The media server passes client configuration information to the BMR Master server
5. The BMR Master server stores client configuration information to BMR database
6. Normal backup begins



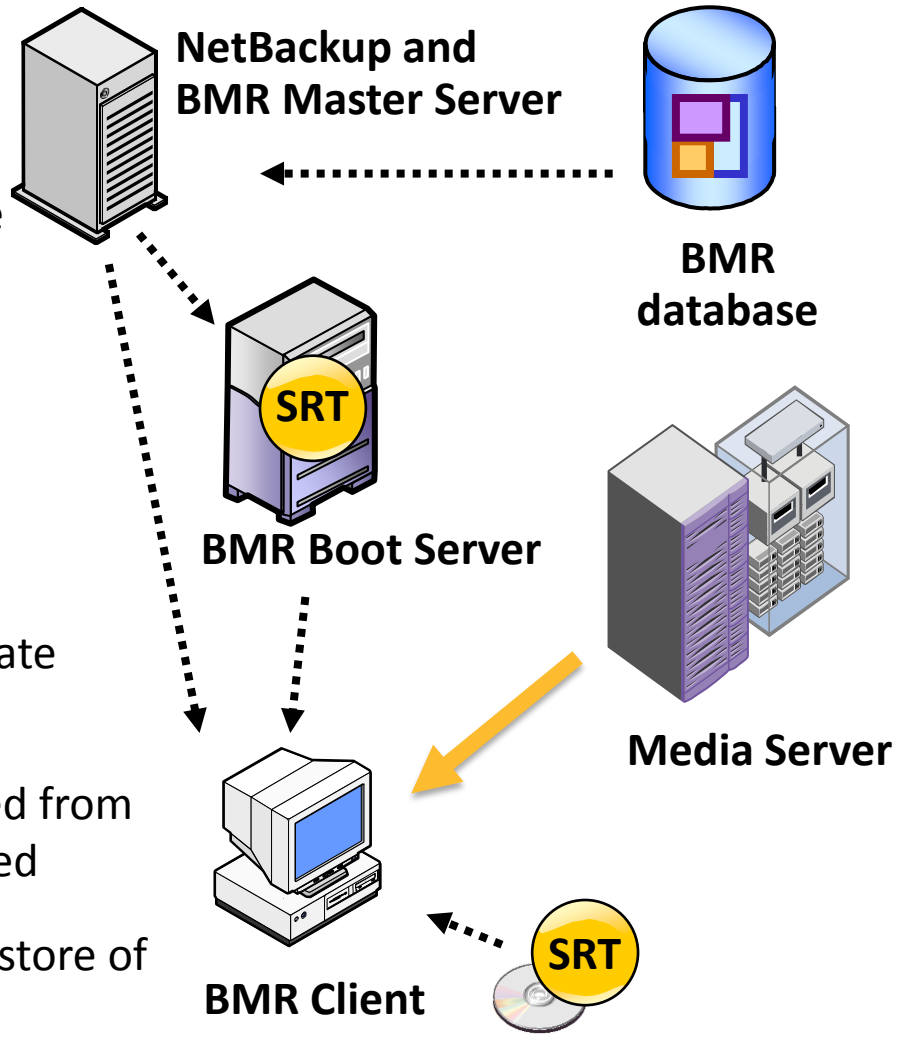
Whiteboards: BMR
BMR Client Restore Workflow

Prepare to restore

1. BMR Master Server retrieves the client configuration
2. The BMR Master Server creates the restore procedures
3. The BMR Master Server allocates the BMR Boot Server

Restore

4. The client boots from network or media
5. The client accesses the SRT and create temporary restore environment
6. The restore procedures are retrieved from the BMR Master Server and executed
7. The restore procedure initiates a restore of the client's data from NetBackup.



- The BMR master server is bundled with NetBackup master server and is installed along with NetBackup master server.
- The BMR boot server software is installed when you install the NetBackup client. No separate installation is required.
- The BMR client software automatically installed with the NetBackup client software. No special installation or configuration is required.
- Previously, the BMR Master Server acted as the license server for BMR clients. As of the 6.5 release, no separate BMR license is required. Both the NetBackup Enterprise Client and the Standard Client licenses include BMR.

Network services on boot Server for Network Boot

For Network boot based recovery, BMR leverages OS specific NW boot protocols to start recovery. Different NW configurations like PXE, bootp, DHCP, or TFTP, would need to be done for network boot recovery depending on the type of OS.

Type of server	TFTP	DHCP	NFS	BOOTP	PXE
Redhat	✔	✔	✔		
SUSE	✔	✔	✔		
Solaris	✔	✔	✔	✔	
HPUX	✔		✔	✔	
AIX	✔		✔	✔	
Windows	✔	✔			✔

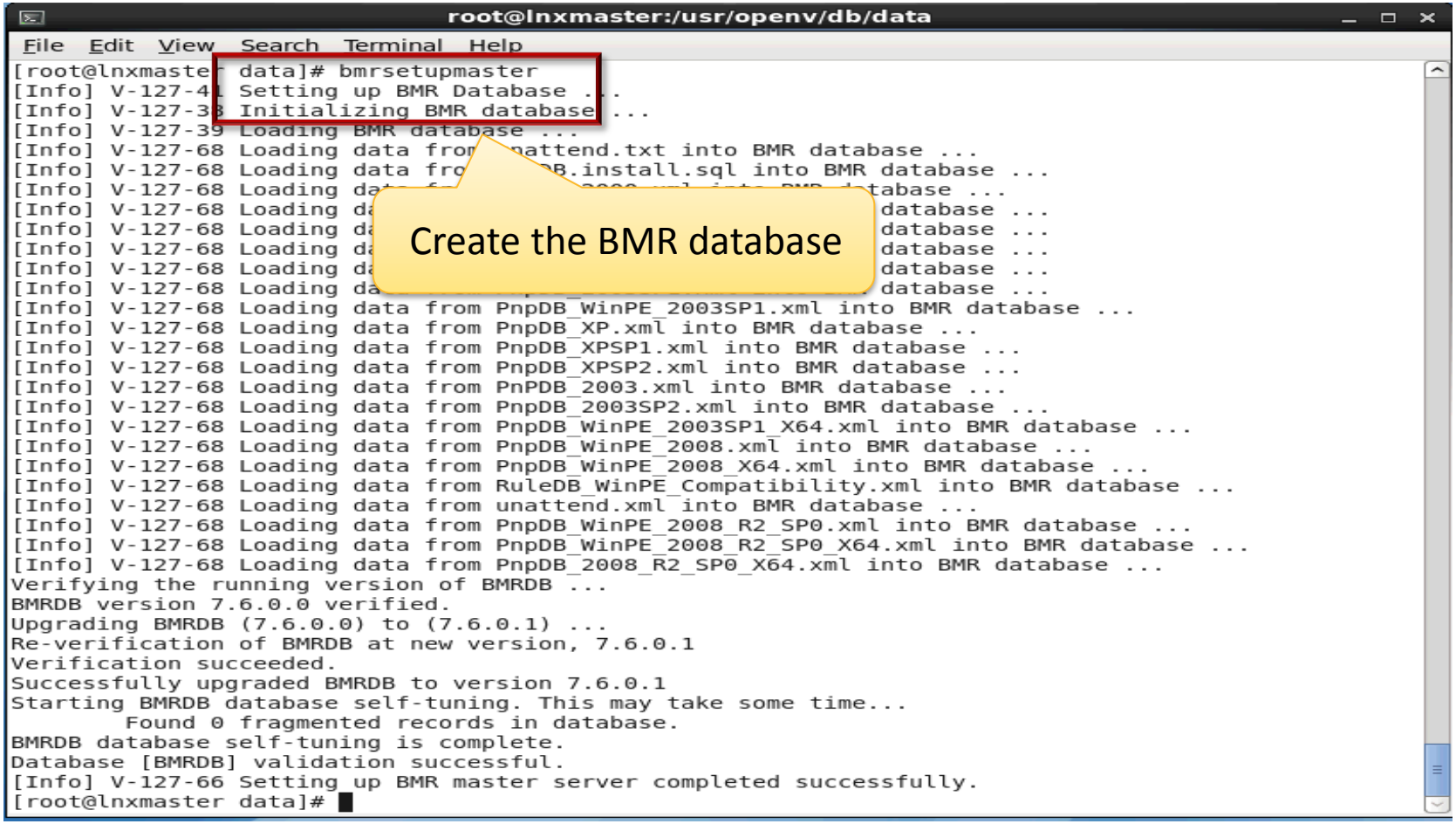
Configuring BMR

1. Configure BMR Master server
2. Configure BMR Boot Servers
3. Create Shared Resource Trees (SRTs)
4. Build BMR boot medias
5. Configure Backup Policies

Example Diagram : BMR
Configure BMR Master server on UNIX/Linux

Log on as the root user on Master and run the following command:

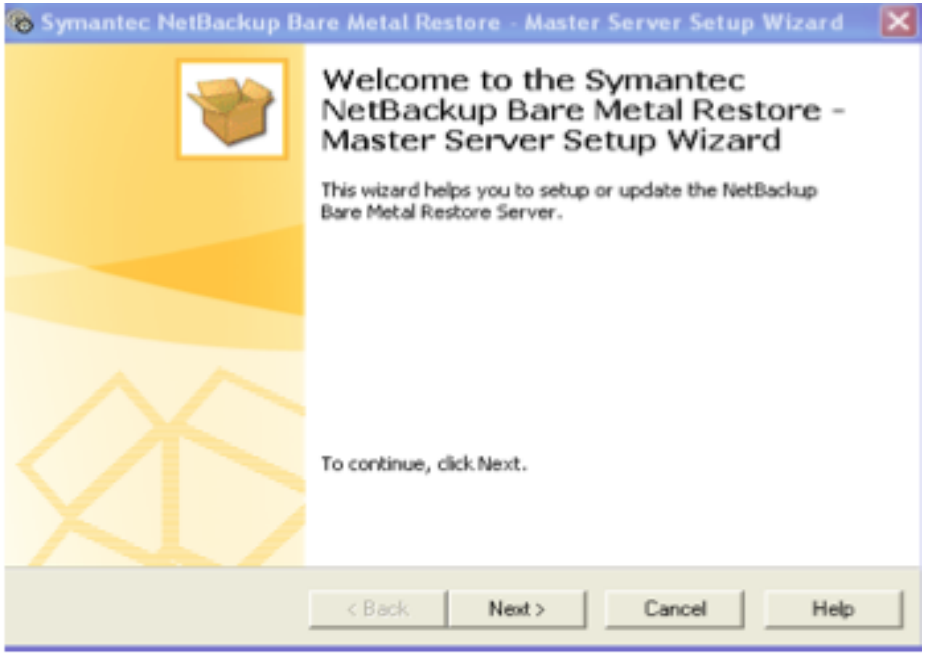
bmrsetupmaster



Use the Master Server Setup Wizard to set up the Bare Metal Restore master server on a Windows system.

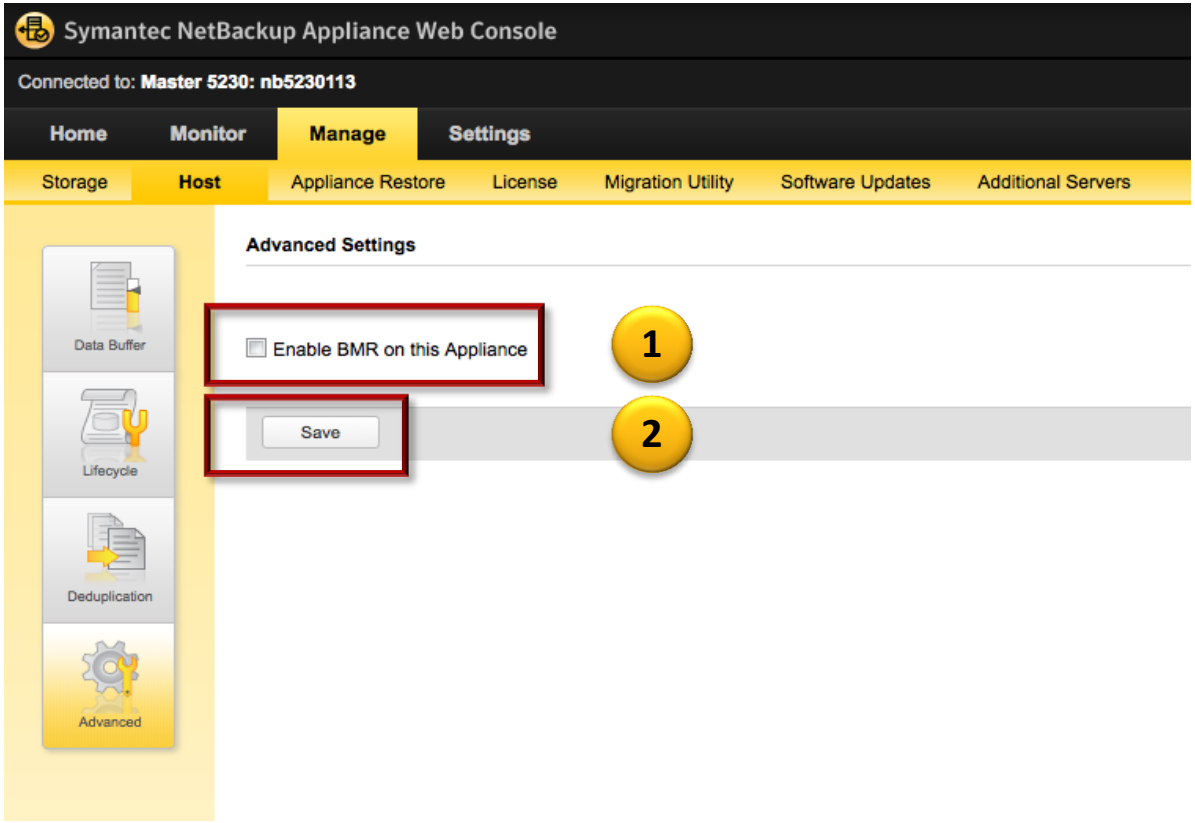
1. On the Windows BMR master server, select **Programs > Symantec NetBackup > Bare Metal Restore -- Master Server Setup** from the **Start** menu.

2. Follow the prompts to set up the BMR master server.



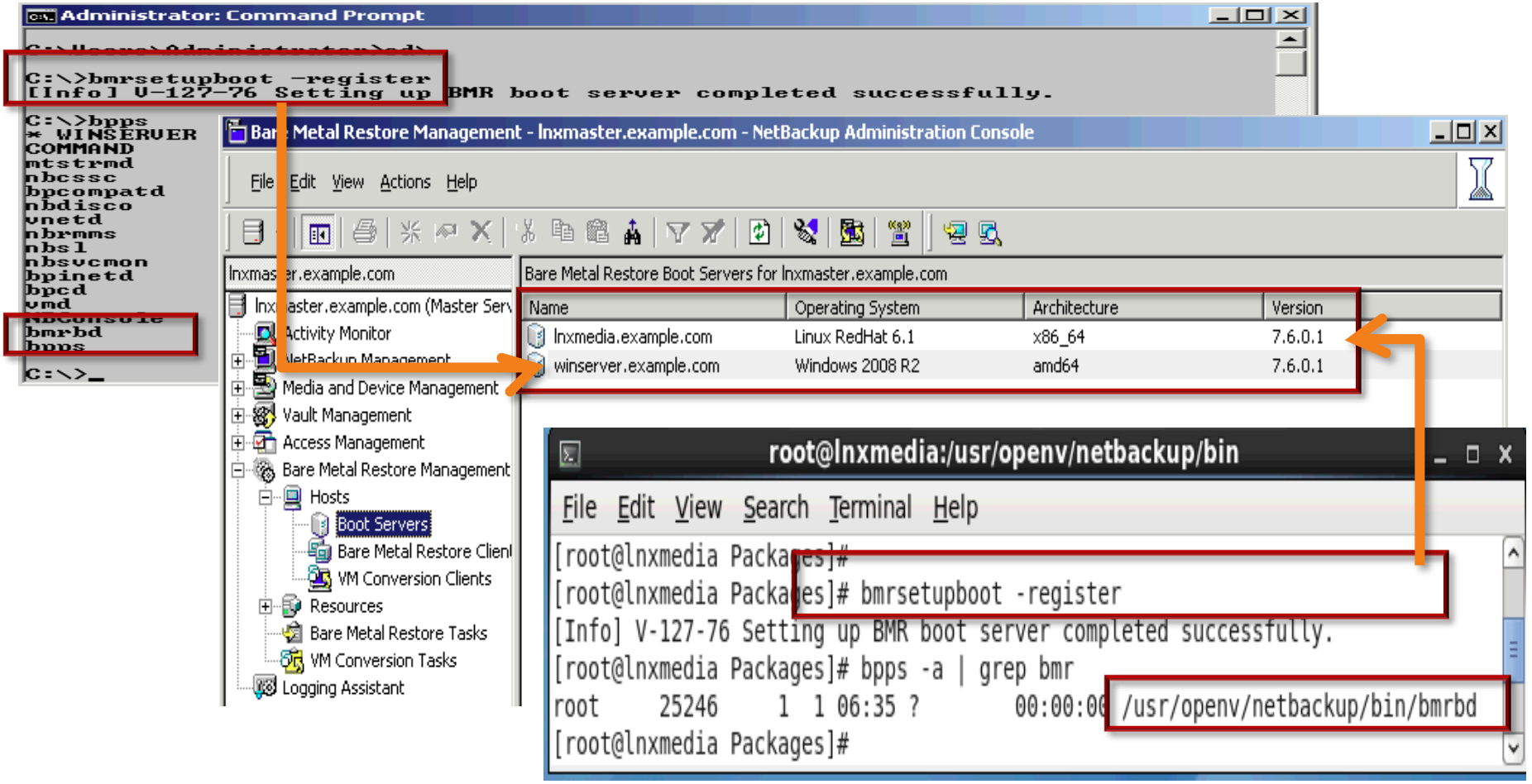
Example Diagram : BMR
Configure BMR Master server on Appliance

- BMR can be enabled from **Manage > Hosts > Advanced** in the NetBackup Appliance Web Console when the appliance is configured as a master server.
- BMR is disabled by default.



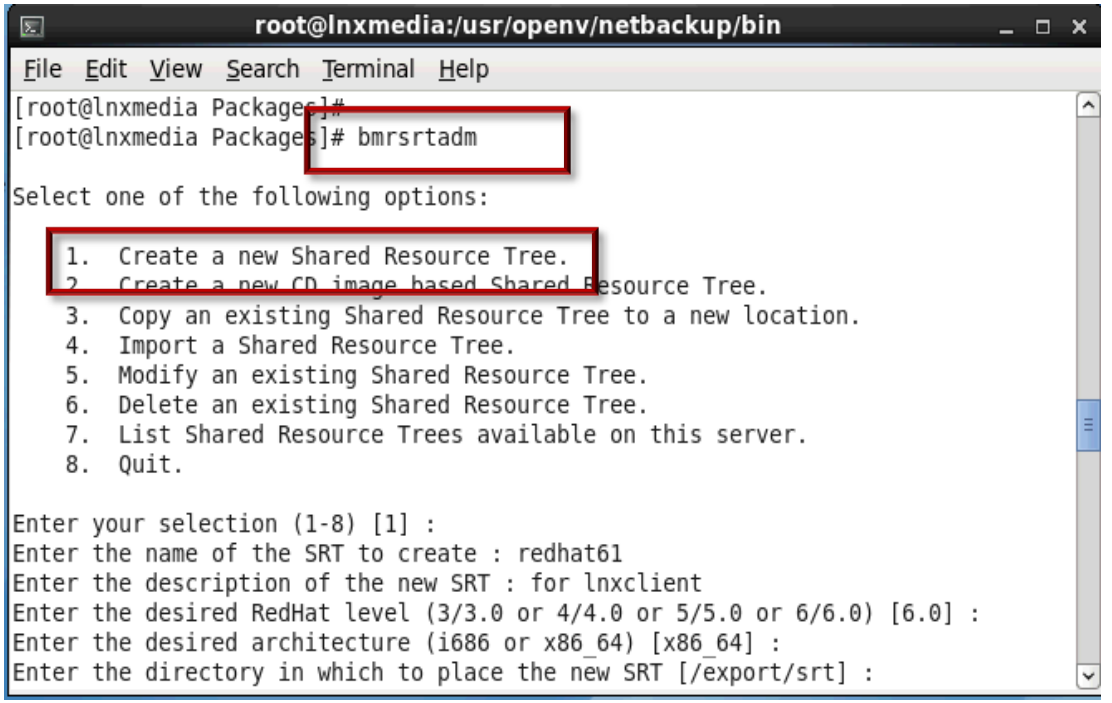
Example Diagram : BMR
Configure BMR Boot server

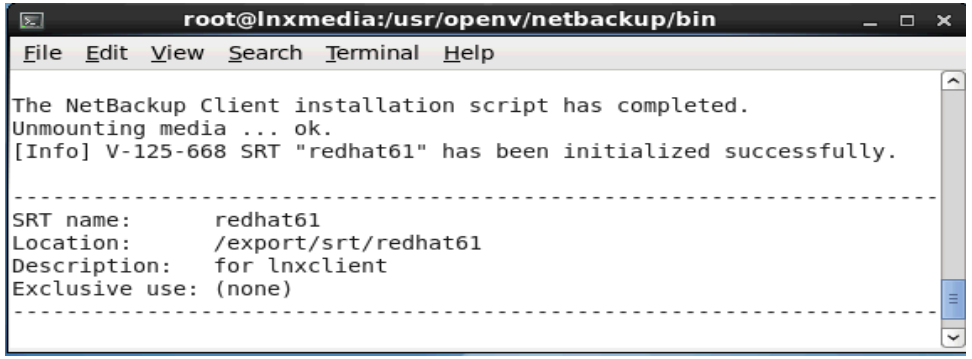
To set up a BMR boot server, run the bmrsetupboot –register command on the boot server host.



Whiteboards: BMR
Creating UNIX/Linux SRTs Using `bmrsrtadm`

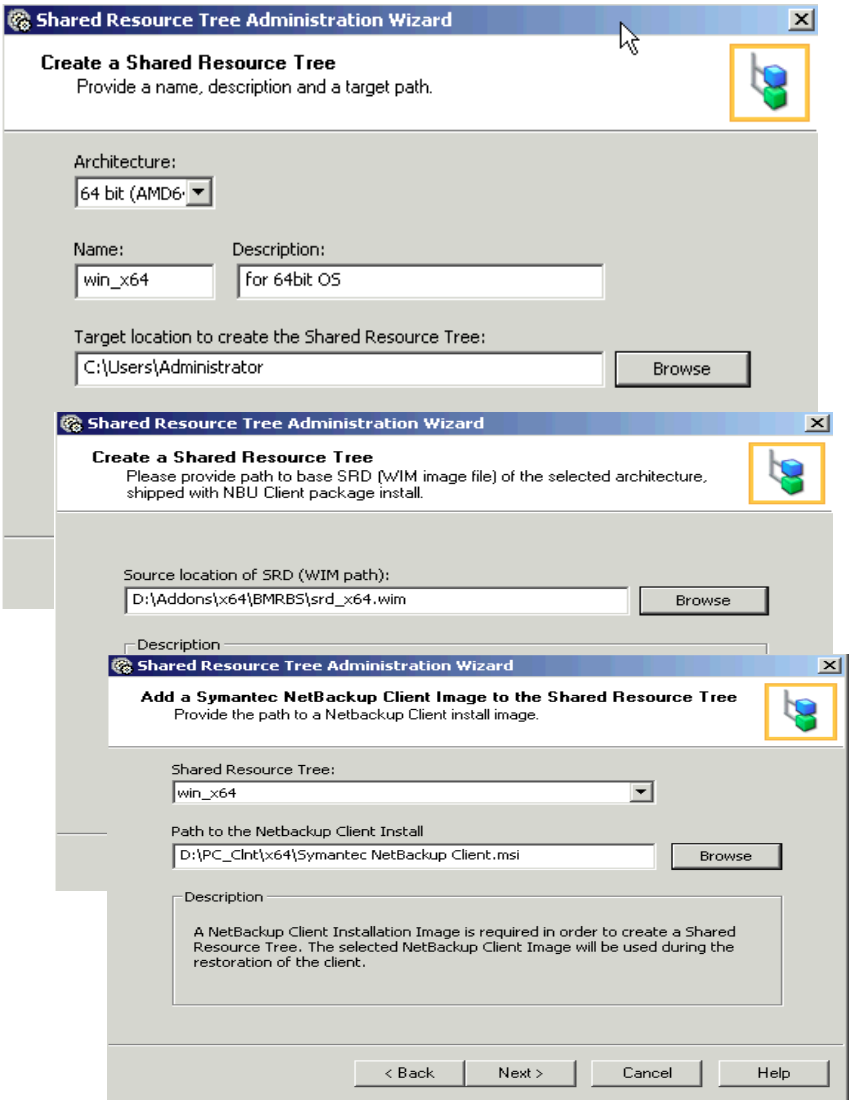
1. Enter the name of the SRT.
2. Enter a description of the SRT.
3. Enter the level of OS and Architecture (32/64).
4. Specify the path to the directory in which to create the SRT.
5. Enter the path to the OS installation files.
6. Enter the name of the device in which the BMR Third-Party Products CD (Linux only).
7. Enter the path to the NetBackup client installation files.
8. Answer the various NetBackup installation prompts.



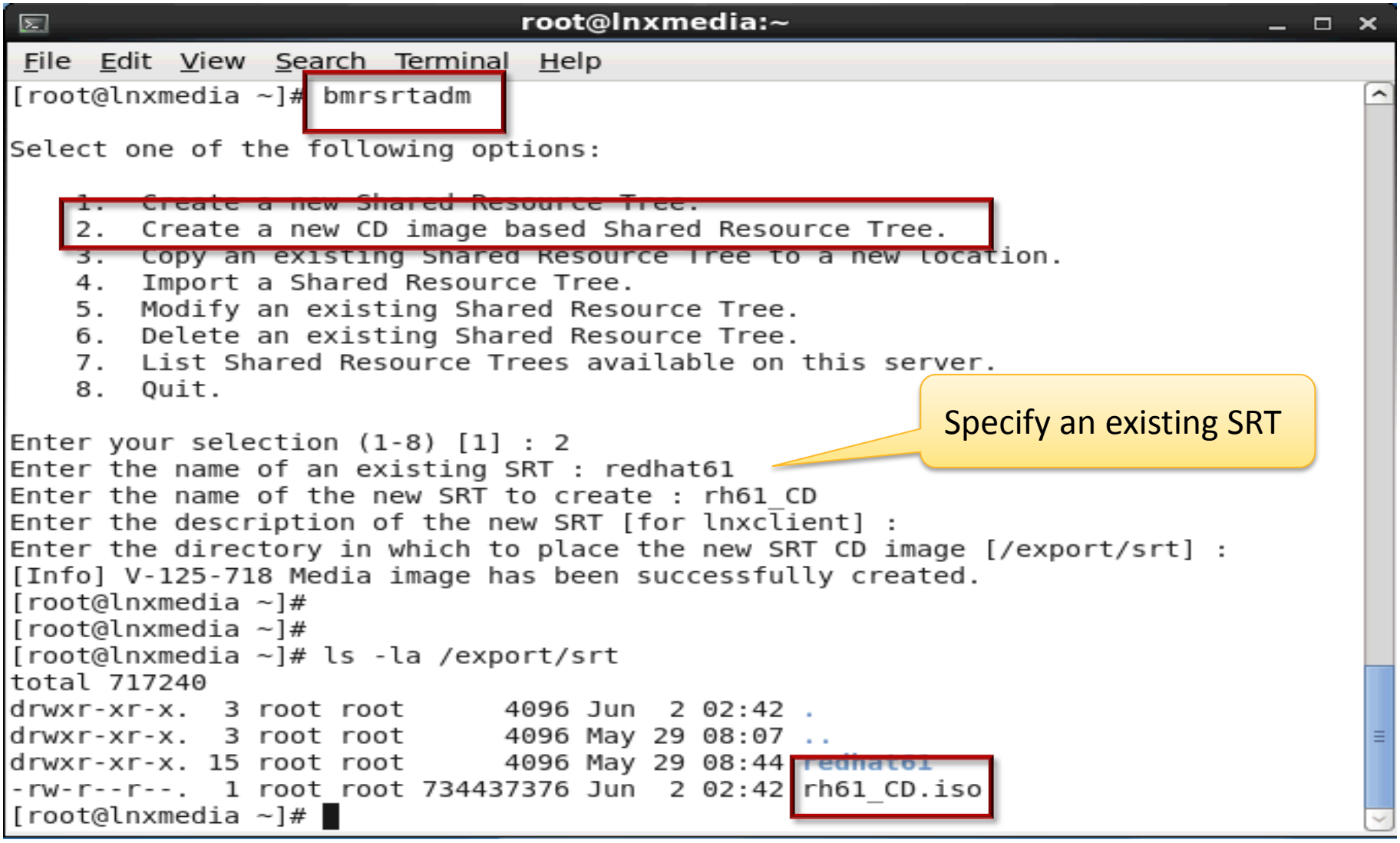


Creating Fast Restore SRTs for Windows

1. From the Start menu on the Windows BMR boot server that is to host the SRT, select Programs > Symantec NetBackup > Bare Metal Restore Boot Server Assistant.
2. Click Shared Resource Tree Administration Wizard.
3. Select the option to create a shared resource tree.
4. Select the type of Shared resource tree: Fast Restore SRTs or Legacy SRTs.
5. Select Architecture, enter the name, description and target location for SRT.
6. Specify the source location of SRD.
7. Enter the path of NetBackup client software image.

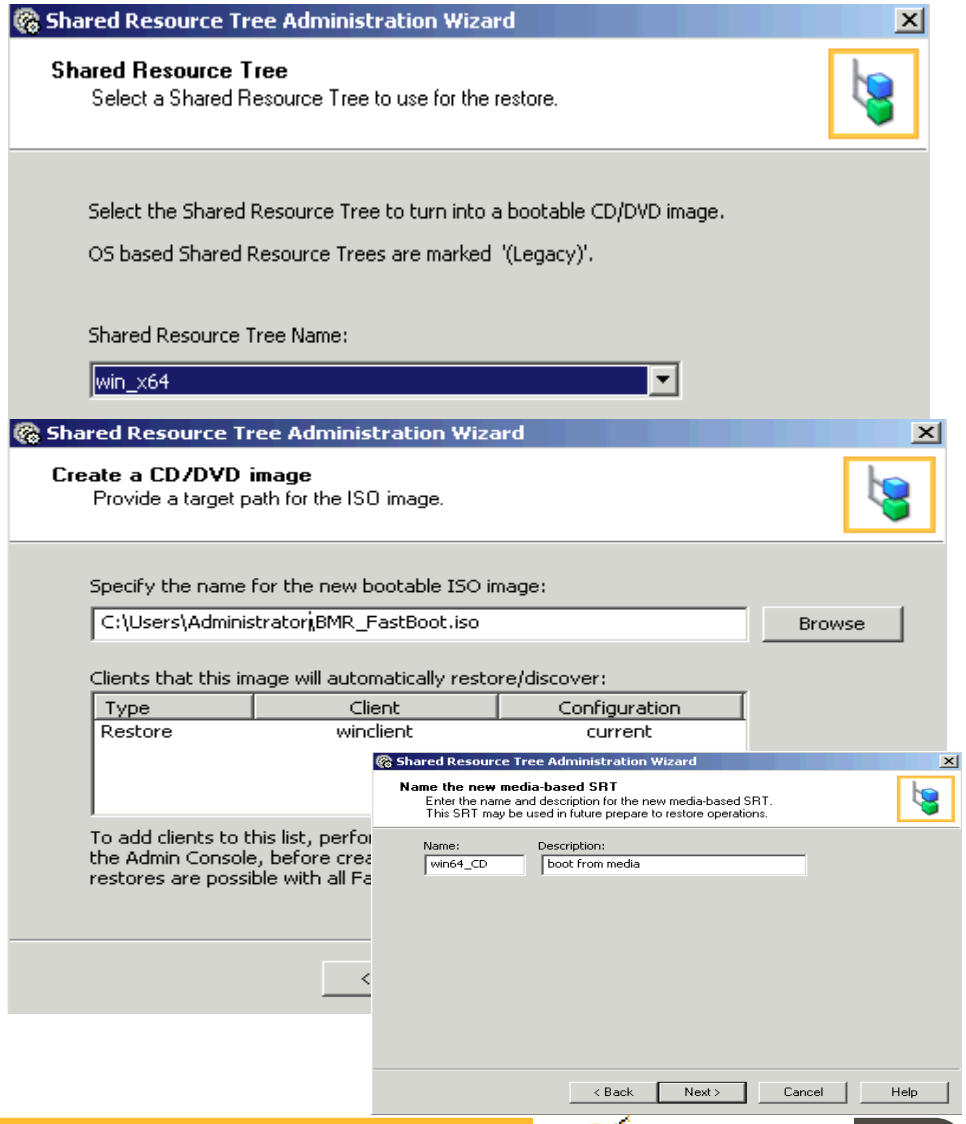


Example Diagram : BMR
Creating a UNIX/Linux Boot Media from SRT

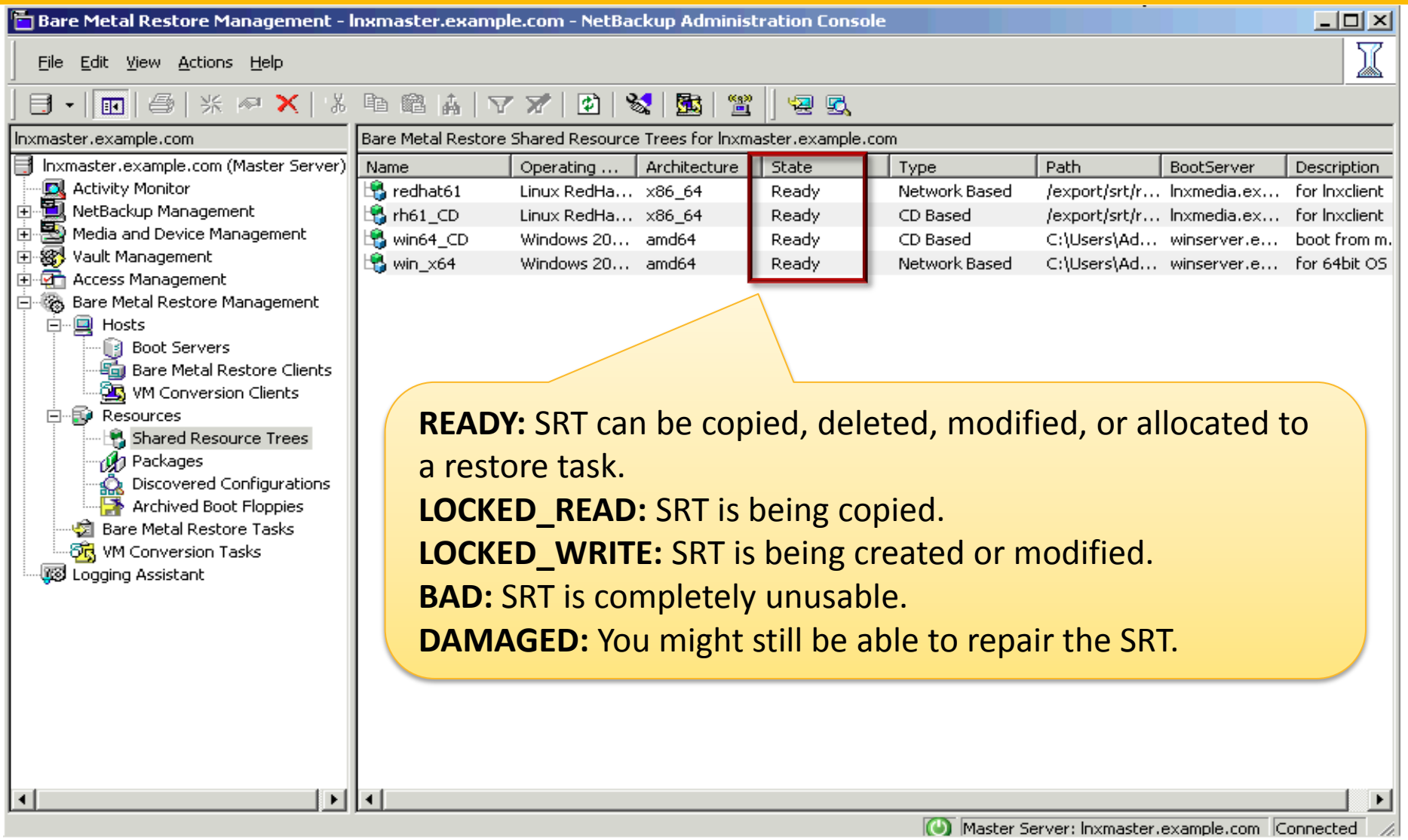


Whiteboards: BMR
Creating a Windows Boot Media from SRT

1. Prepare to restore the client.
2. From the Start menu on the Windows BMR boot server that is to host the SRT, select Programs > Symantec NetBackup > Bare Metal Restore Boot Server Assistant.
3. Click Shared Resource Tree Administration Wizard.
4. Select the option for Create a Bootable CD/DVD from a Shared Resource Tree.
5. Select the SRT to use for the bootable image.
6. Select a target directory to be used in the create ISO process.
7. Enter the SRT name and description.

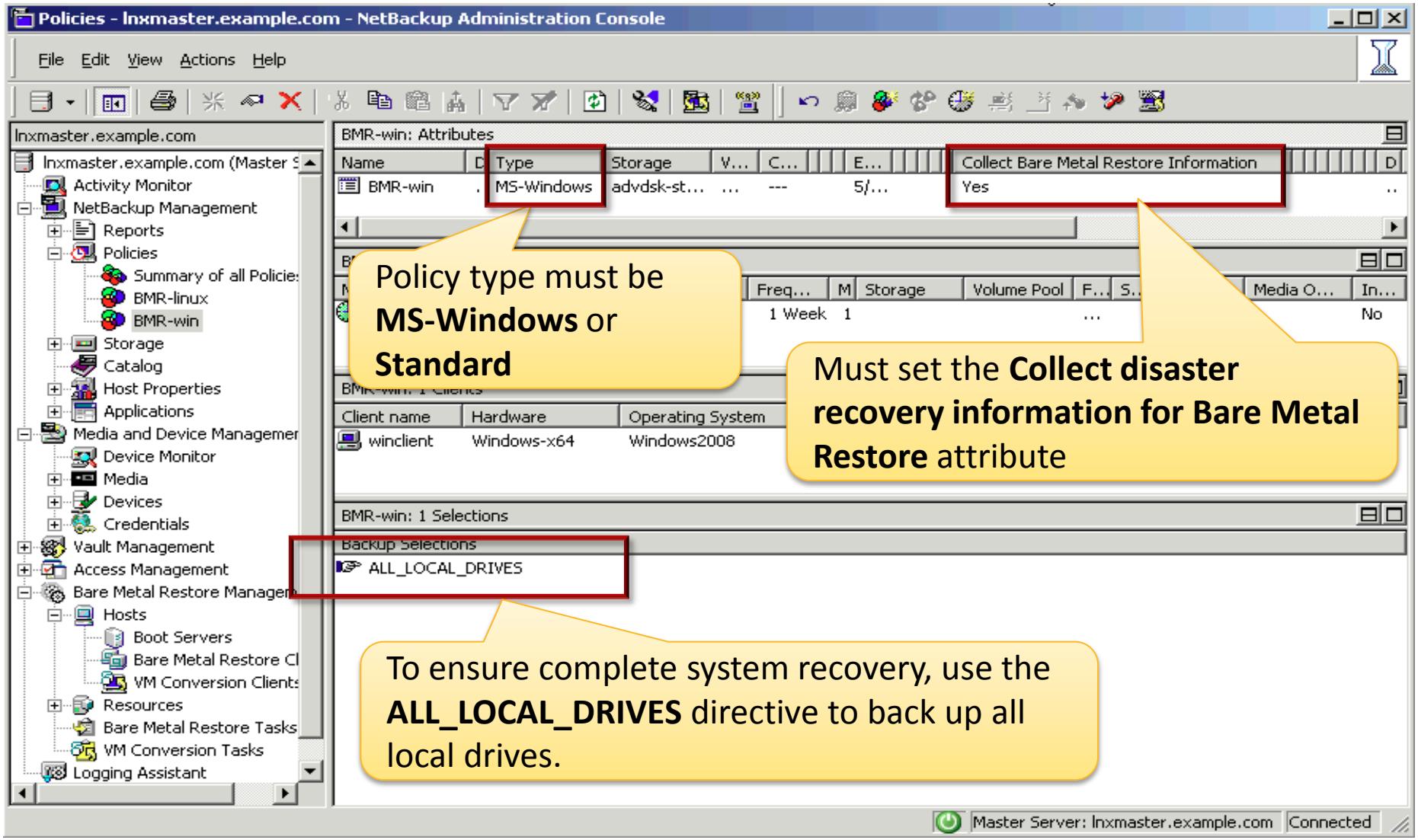


Example Diagram : BMR
SRT States



READY: SRT can be copied, deleted, modified, or allocated to a restore task.
LOCKED_READ: SRT is being copied.
LOCKED_WRITE: SRT is being created or modified.
BAD: SRT is completely unusable.
DAMAGED: You might still be able to repair the SRT.

Example Diagram : BMR
Configuring policies for BMR clients

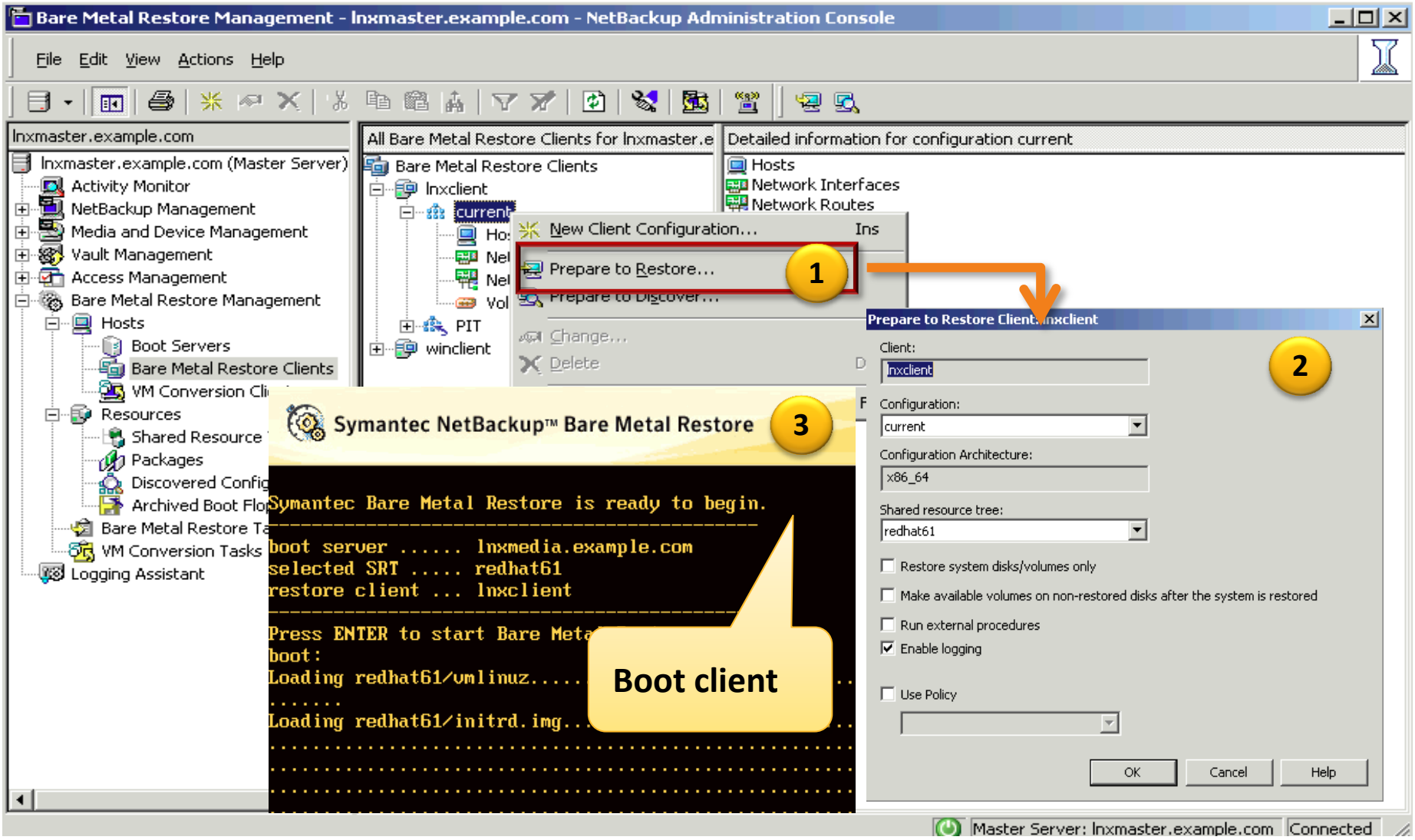


Policy type must be **MS-Windows** or **Standard**

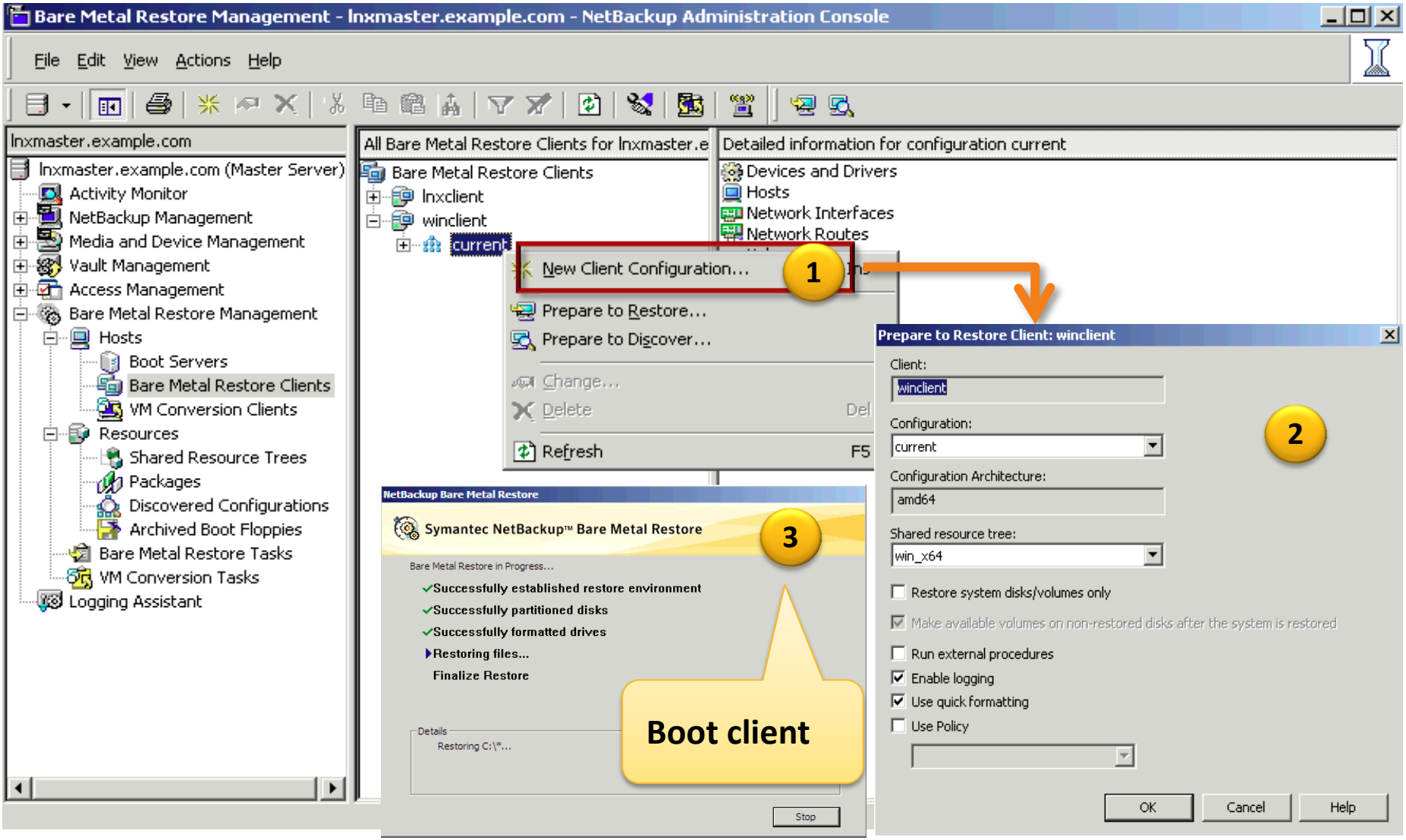
Must set the **Collect disaster recovery information for Bare Metal Restore** attribute

To ensure complete system recovery, use the **ALL_LOCAL_DRIVES** directive to back up all local drives.

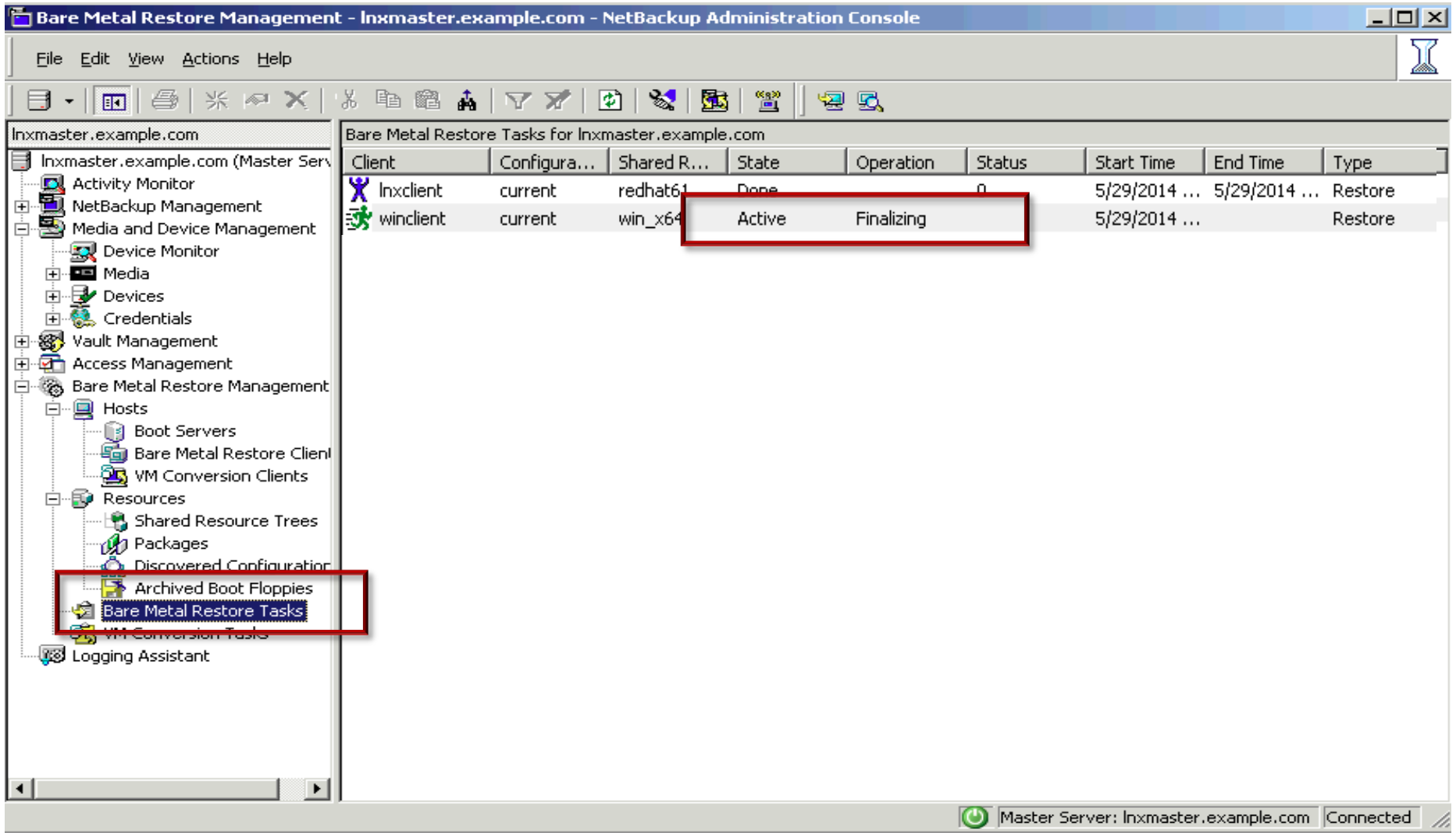
Example Diagram : BMR
Restoring UNIX/Linux clients using network boot



Example Diagram : BMR
Restoring Windows clients using network boot

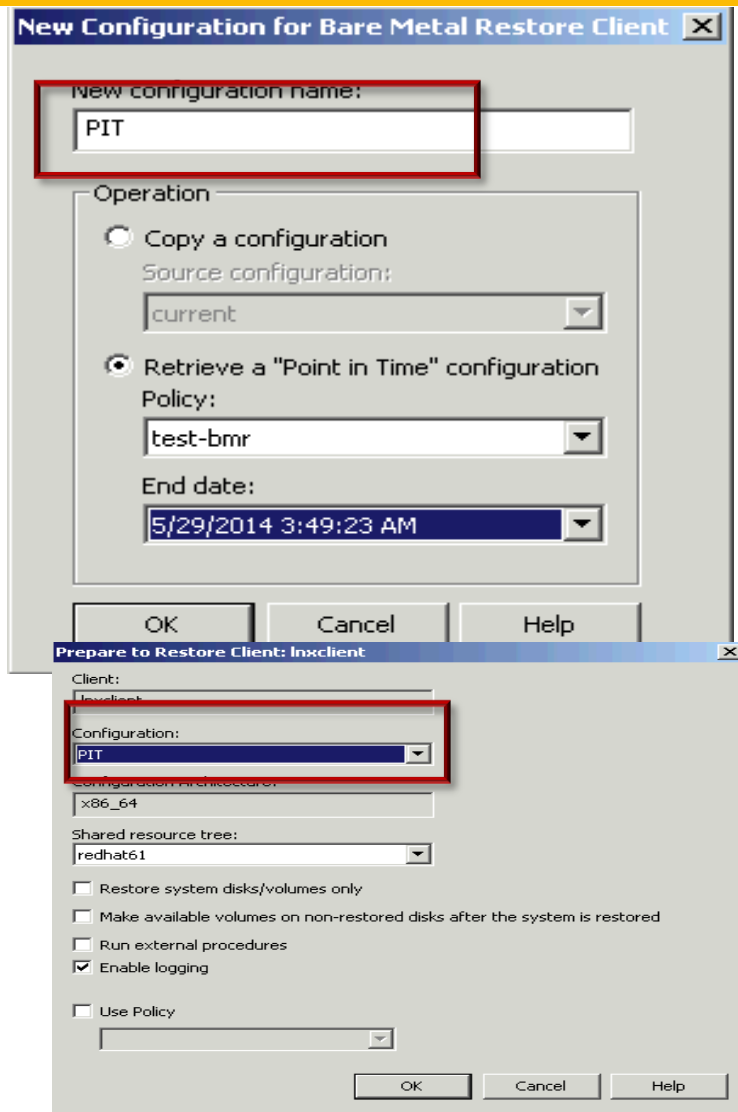


Example Diagram : BMR
Monitorng BMR Tasks



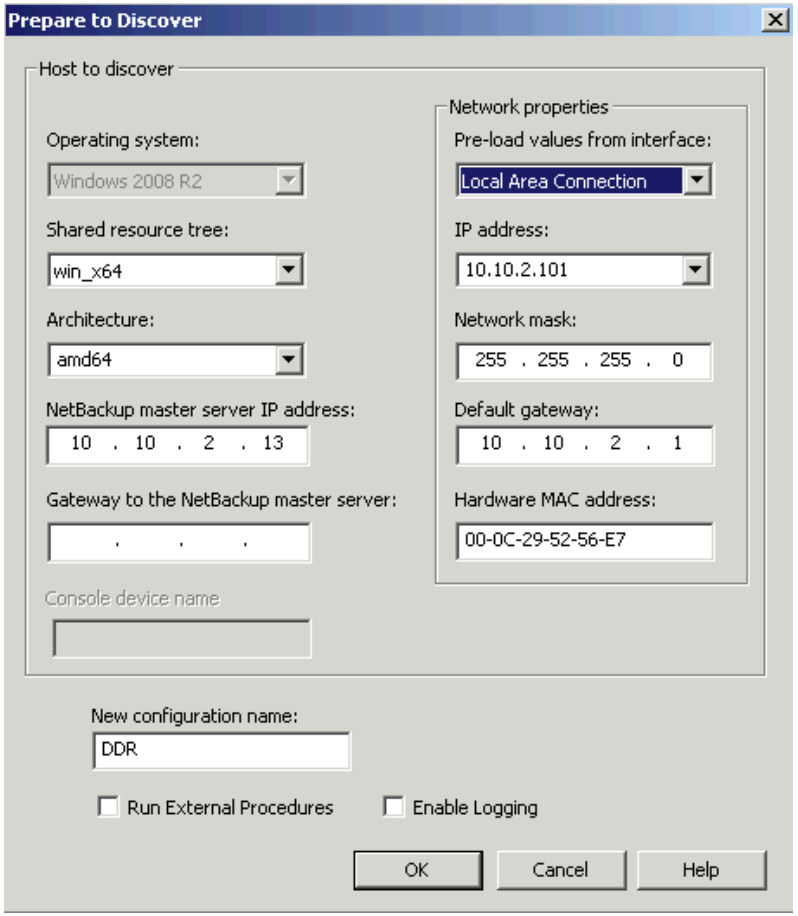
Whiteboards: BMR
Restoring to a Point in Time

1. Open Bare Metal Restore Clients view.
2. Right-click the current configuration for a client and select **New Client Configuration.**
3. Enter a new configuration name.
4. Click **Retrieve a PIT Configuration.**
5. Select the **Policy** and **End Date** for the restore.
6. Click **OK.**
7. **Prepare to restore** the client using the new configuration.
8. Perform the restore.



Whiteboards: BMR
Dissimilar Disk Restore (DDR) workflow

1. Discover the client using Prepare to discover procedure.
2. Boot the client to start the hardware discovery operation.
3. Copy the configuration to a new editable one.
4. Open the Change configuration dialog box for the new configuration.
5. Initialize and map the volume layout in the new configuration.
6. Prepare to restore the client using the new configuration.
7. Boot the client to begin the restore.

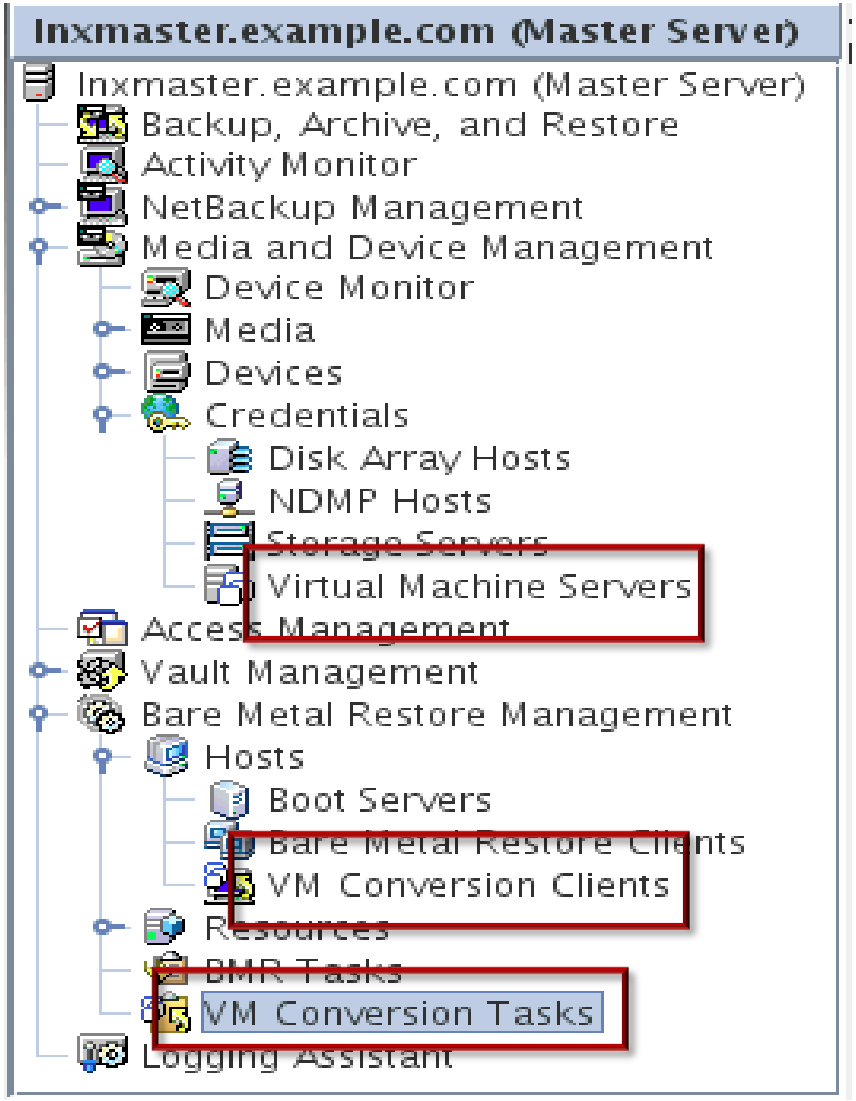


Dissimilar System Restore (DSR) workflow

1. Discover the configuration of the target system.
2. Create an editable DSR configuration.
3. **Add NIC and MSD drivers.**
4. **Change network interfaces.**
5. **Map the disks.**
6. **Create boot media** If you use media to start the target system.
7. **Restore the client.**
8. **Log on to the client as an administrator.**

Whiteboards: BMR
Client-VM conversion workflow

1. Take BMR enabled Client Backup.
2. Register Hypervisor server and NetBackup recovery host in NetBackup master(Single time registeration).
3. Run “Backup to virtual machine conversion” wiward or run the command line.
4. Find selected client VM created and powered-on the VM.



BMR Logs

Following are the originator IDs for the BMR processes that perform logging:

119: bmrd and bmrbd

121: bmrsavecfg

122: bmrc

123: bmrs

125: bmrsrtadm

126: bmrprep

127: bmrsetupmaster and bmrsetupboot

128: Miscellaneous

129: bmrconfig

130: bmrcreatepkg.exe (Windows systems only)

131: bmrrst.exe and bmrmap.exe (Windows systems only)

142: bmrepadm

152: bmrovradm

248: bmrlauncher

433: bmrb2v

434: bmrb2vrst

Life Preservers

- If you use more than one policy to back up a client, use the exact same name for the client in each policy.
- Ensure that client restore requests are allowed by the BMR Master Server and BMR client.
- The boot server must be on same subnet as their clients or have `bootp` relays configured depending on the intricacies of the specific platform.
- To avoid incomplete client backup operations:
  - For UNIX clients, retry file backups if a file changes during the backup attempt.
  - For Windows clients, use the Windows Open File Backup option.
- Ensure that no other network boot services except the valid one providing BMR client network boot is running in the same subnet.

- NetBackup 7.6 Bare Metal Restore Administrator's Guide

http://www.symantec.com/docs/DOC6472

- NetBackup 7.x hardware compatibility list (HCL)

http://www.symantec.com/docs/TECH76495

- NetBackup 7.x operating system compatibility list

http://www.symantec.com/docs/TECH76648

- Requirements for Bare Metal Restore (BMR) Boot Servers

http://www.symantec.com/docs/TECH87607

Thank You!

NetBackup Product Management